

WE CLAIM:

- 1 1. A sample handler for retaining a plurality of sample fluids, said handler comprising:
 - 2 sample handling means for retaining a plurality of sample
 - 3 fluids; and
 - 4 a plurality of metering tips retained by said sample handling means, each of
 - 5 said metering tips having a sealable dispense end and retaining a volume of test fluid,
 - 6 each of said metering tips when sealed serving as a sample container for use with at
 - 7 least one chemistry system of a clinical analyzer.
- 1 2. A sample handler as recited in Claim 1, wherein said sample handling means includes
2 a plurality of first tip receiving stations, each of said first tip receiving stations being
3 sized to retain a sealed metering tip.
- 1 3. A sample handler as recited in Claim 1, including sealing means for sealing each of
2 said metering tips.
- 1 4. A sample handler as recited in Claim 3, wherein said sealing means includes a heated
2 element disposed in relation to said sample handling means.
- 1 5. A sample handler as recited in Claim 1, including tip supply means for retaining a
2 plurality of unsealed metering tips.
- 1 6. A sample handler as recited in Claim 1, including means for testing the sample
2 retained within a said sealed metering tip.
- 1 7. A sample handler as recited in Claim 6, wherein said testing means includes a
2 spectrophotometer.
- 1 8. A sample handler as recited in Claim 1, wherein said sample retaining means includes
2 a first ring, said first ring having a plurality of first tip retaining stations.

- 1 9. A sample handler as recited in Claim 8, including tip supply means for retaining a
2 plurality of unsealed metering tips, said tip supply means including a second ring
3 having a plurality of second tip retaining stations.

- 1 10. A sample handler as recited in Claim 9, wherein said first ring and said second ring
2 are concentric.

- 1 11. A sample handler as recited in Claim 10, wherein each of said first and second rings
2 are independently driven about a common axis of rotation.

- 1 12. A sample handler as recited in Claim 11, wherein each of said rings are
2 bidirectionally rotatable about said common axis of rotation.

- 1 13. A sample handler as recited in Claim 8, including a cover for covering said first ring.

- 1 14. A sample handler as recited in Claim 13, wherein said cover includes at least one
2 aspiration station aligned with said plurality of first tip retaining stations.

- 1 15. A clinical analyzer for testing patient fluids, said analyzer comprising:
2 a housing:
3 at least one chemistry system retained within said housing;
4 first sample handling means for handling a plurality of first patient sample
5 containers; and
6 second sample handling means for retaining a plurality of second patient sample
7 containers, each of said sample handling means being interconnected with said at
8 least one said chemistry system.

- 1 16. The clinical analyzer of Claim 15, including first conveying means for conveying a
2 quantity of sample from said first sample handling means to said at least one
3 chemistry system.

1 17. The clinical analyzer of Claim 16, wherein said first conveying means utilizes at least
2 one metering tip, said metering tip being sized for aspirating a quantity of sample
3 from a first sample container through a dispense end thereof.

1 18. The clinical analyzer of Claim 17, wherein second sample handling means comprises
2 said at least one metering tip having aspirated sample from said first sample
3 container.

1 19. The clinical analyzer of Claim 18, including means for sealing the dispense end of
2 each of said metering tips containing aspirated sample prior to moving a said tip to
3 said second sample handling means.

1 20. The clinical analyzer of Claim 18, including means for optically testing the contents
2 of each of said metering tips.

1 21. The clinical analyzer of Claim 19, wherein said optical testing means are disposed
2 within said second sample handling means.

1 22. The clinical analyzer of Claim 18, wherein said second sample handling means
2 further includes a supply of unsealed metering tips, said supply of metering tips being
3 interconnected to said first conveying means.

1 23. The clinical analyzer of Claim 19, wherein each of said metering tips are disposable.

1 24. The clinical analyzer of Claim 18, including a dump station for the second patient
2 sample containers following use thereof.

1 25. The clinical analyzer of Claim 19, wherein said second sample handling means
2 includes at least one ring member, said at least one ring member having a plurality of
3 stations for retaining a corresponding number of sealed metering tips, said at least one
4 ring member being rotatably supported for movement about an axis of rotation.

1 26. The clinical analyzer of Claim 25, including means for rotatably driving said at least
2 one ring member bidirectionally about said axis of rotation.

1 27. The clinical analyzer of Claim 25, wherein said second sample handling means
2 includes a pair of concentric ring members, each of said ring members being rotatable
3 about a common axis of rotation.

1 28. The clinical analyzer of Claim 27, wherein each of said concentric ring members are
2 driven independently of one another.

1 29. The clinical analyzer of Claim 28, wherein one of said ring members includes a
2 plurality of stations, each station being sized for supporting a sealed sample
3 containing metering tip.

1 30. The clinical analyzer of Claim 29, wherein the other of said ring members includes a
2 plurality of stations for supporting a plurality of unsealed metering tips, at least one
3 station of said ring member being disposed along a travel path of said first conveying
4 means to permit an unsealed metering tip to be conveyed to said first sample handling
5 means to permit aspiration thereof.

1 31. The clinical analyzer of Claim 19, including second conveying means for conveying
2 sample contained in said at least one sealed metering tip in said second sample
3 handling means to said at least one chemistry system for testing thereof.

1 32. The clinical analyzer of Claim 18, wherein said first conveying means includes
2 metering means for dispensing a portion of sample aspirated from said metering tip to
3 a said chemistry system and then for conveying said tip to said second sample
4 handling means.

1 33. The clinical analyzer of Claim 19, wherein said tip sealer includes a heated element
2 for fusing the dispense end of a sample containing metering tip.

1 34. The clinical analyzer of Claim 21, wherein said second sample handling means
2 includes at least one ring member, said at least one ring member having a plurality of
3 stations for retaining said second sample containers, said optical testing means being
4 disposed in relation to a predetermined position of said ring member.

1 35. The clinical analyzer of Claim 34, further including a mechanism to align a lifted
2 second sample container with an optical instrument of said optical testing means.

1 36. The clinical analyzer of Claim 35, wherein said optical instrument is a
2 spectrophotometer.

1 37. The clinical analyzer of Claim 15, wherein said second sample handling means
2 includes a ring member having a plurality of stations, said rotor being supported for
3 rotation about an axis of rotation, said ring member being aligned with first and
4 second conveying means for conveying sample from said second sample containers to
5 said at least one chemistry system.

1 38. The clinical analyzer of Claim 25, including at least one sensor or detecting whether
2 station of said second sample handling means is empty prior to the placement of a
3 sealed sample containing metering tip therein.

1 39. The clinical analyzer of Claim 38, wherein said at least one sensor further detects
2 whether said sealed tip has been successfully placed in the second sample handling
3 means by said first conveying means.

1 40. The clinical analyzer of Claim 30, wherein the supply of unsealed metering tips is
2 provided in an outer ring member and said second sample handling means is provided
3 in an inner ring member.

1 41. A buffer for interconnecting respective chemistry systems of a combinational clinical
2 analyzer having a primary sample supply, said buffer comprising:
3 sealed tip retaining means for retaining a plurality of sealable

4 metering tips, each of said tips containing a quantity of sample aspirated from said
5 primary sample supply, said buffer acting as an auxiliary sample supply in connection
6 with at least one of said chemistry systems.

1 42. The buffer of Claim 41, including sealing means for sealing a dispense end of each of
2 said metering tips containing aspirated sample.

1 43. The buffer of Claim 42, including test means for optically testing the contents of each
2 of said sealable metering tips.

1 44. The buffer of Claim 41, including unsealed tip retaining means for retaining a supply
2 of unsealed metering tips, said supply of metering tips being interconnected to a first
3 conveying means of said analyzer linking said metering tip supply to said primary
4 sample supply.

1 45. The buffer of Claim 42, including a dump station for the sealed metering tips
2 following use thereof.

1 46. The buffer of Claim 41, wherein said sealed tip retaining means includes at least one
2 ring member, said at least one ring member having a plurality of stations for retaining
3 said plurality of sealed metering tips, said at least one ring member being rotatably
4 supported for movement about an axis of rotation.

1 47. The buffer of Claim 46, including means for rotatably driving said at least one ring
2 member bidirectionally about said axis of rotation.

1 48. The buffer of Claim 46, including a pair of concentric ring members, each of said
2 rings being rotatable about a common axis of rotation.

1 49. The buffer of Claim 48, wherein each of said concentric ring members are driven
2 independently of one another.

1 50. The buffer of Claim 49, wherein one of said ring members includes a plurality of
2 stations, each station being sized for supporting a sealed sample containing metering
3 tip.

1 51. The buffer of Claim 50, wherein the other of said ring members includes a plurality of
2 stations for supporting a supply of unsealed metering tips, at least one station of said
3 ring member being disposed along a travel path of a first conveying means linking
4 said tip supply with said primary sample supply to permit an unsealed metering tip to
5 be conveyed to said primary sample supply to permit aspiration of fluid.

1 52. The buffer of Claim 51, wherein said analyzer includes second conveying means for
2 conveying sample contained in said at least one sealed metering tip in said buffer to at
3 least one of said dry and wet chemistry system for testing thereof.

1 53. The buffer of Claim 42, wherein said sealing means includes a heated element for
2 fusing the dispense end of a sample containing metering tip.

1 54. The buffer of Claim 43, including at least one ring member having a plurality of
2 stations for retaining said sealed metering tips, said optical testing means being
3 disposed in relation to a predetermined position of said ring member.

1 55. The buffer of Claim 54, further including means for aligning a second sample
2 container with an optical instrument of said optical testing means.

1 56. The buffer of Claim 55, wherein said optical instrument is a spectrophotometer.

1 57. The buffer of Claim 41, wherein said sealed tip retaining means includes a ring
2 having a plurality of stations, said ring member being supported for rotation about an
3 axis of rotation and aligned with first and second conveying means of said analyzer
4 for conveying sample from at least one sealed metering tips to each of said chemistry
5 systems.

1 58. The buffer of Claim 50, including at least one sensor or detecting whether a
2 predetermined station of said buffer is empty prior to the placement of a sealed
3 sample containing metering tip therein by said first conveying means.

1 59. The buffer of Claim 58, wherein said at least one sensor further detects whether said
2 tip has been successfully placed in the buffer by said first conveying means.

1 60. The buffer of Claim 51, wherein the supply of unsealed metering tips is provided in
2 an outer ring member and said plurality of sealed metering tips is provided in an inner
3 ring member each of said rings being concentric.

1 61. A method for coordinating the use of a clinical analyzer, said analyzer having at least
2 one contained chemistry system, said method including the steps of:
3 introducing a quantity of sample fluid into at least one metering tip;
4 sealing the dispense end of said at least one metering tip; and
5 utilizing said at least one sealed metering tip as a sample container for use with said at
6 least one contained chemistry system of said analyzer.

1 62. A method as recited in Claim 61, wherein said introducing step includes the step of
2 aspirating a quantity of sample fluid from a primary sample supply into said at least
3 one metering tip.

1 63. A method as recited in Claim 62, wherein said primary sample supply includes a
2 plurality of primary sample containers, said utilizing step includes the step of using
3 said at least one metering tip as a secondary sample container.

1 64. A method as recited in Claim 62, including the step of dispensing a quantity of
2 sample fluid for use in a chemistry system of said analyzer prior to said sealing step.

1 65. A method as recited in Claim 61, wherein said analyzer includes at least one dry
2 chemistry system and at least one wet chemistry system.

1 66. A method as recited in Claim 65, wherein said at least one sealed tip is used in
2 conjunction with the wet chemistry system of said analyzer.

1 67. A method as recited in Claim 61, including the step of testing the fluid contents
2 contained within said at least one metering tip after said sealing step.

1 68. A method as recited in Claim 61, wherein said utilizing step includes the step of
2 selectively aspirating a quantity of sample from said at least one sealed metering tip
3 for use in said at least one contained chemistry system of said analyzer.

1 69. A method as recited in Claim 61, including the step of providing a plurality of sealed
2 metering tips in an handling assembly, said assembly including a plurality of stations
3 each sized for receiving a sealed metering tip.

1 70. A method as recited in Claim 69, including the step of conveying an unsealed
2 metering tip to a first sample container from a tip supply prior to said aspiration step.

1 71. A method as recited in Claim 70, wherein said tip supply is provided on said handling
2 assembly.

1 72. A method as recited in Claim 61, including the step of selectively disposing of said at
2 least one sealed metering tip after a predetermined number of utilizing steps.

1 73. A method as recited in Claim 68, including the step of rotating said handling
2 assembly in either a first direction or an opposite second direction relative to a
3 rotational axis to move at least one sealed metering tip to an aspiration station.